CLAIMS

What is claimed is:

1. A digital camera comprising:

an image sensor to capture a first image and a subsequent second image of a same scene;

a storage device to store the captured images; and

a processing unit coupled to the storage device to enhance one of the first and second captured images with luminance correction.

2. A digital camera as recited in claim 1, wherein the processing unit comprises one or more processors coupled to the storage device.

3. A digital camera as recited in claim 1, wherein the processing unit comprises at least one processor coupled to the storage device and the storage device stores instructions executed by the at least one processor which enhance one of the first and second captured images with luminance correction.

4. A digital camera as recited in claim 1, wherein the processing unit is implemented as an application-specific integrated circuit (ASIC) or a programmable logic array (PLA).

5. A digital camera as recited in claim 1, wherein the digital camera is coupled to an external computing device to perform one or more acts comprising: controlling the digital camera, accessing data stored on the storage device, and receiving data from the image sensor.

6. A digital camera as recited in claim 1, wherein the storage device is external to the digital camera.

7. A digital camera as recited in claim 1, wherein the storage device comprises a plurality of storage devices.

8. A digital camera as recited in claim 1, wherein the digital camera is a device selected from a group comprising a digital camera, a digital video camera, and a digital camera capable of capturing video.

9. A digital camera as recited in claim 1, wherein no artificial light is present while the first or second images are captured.

10. A digital camera as recited in claim 1, wherein the image sensor remains exposed to light between the capturing of the first and second images.

11. A digital camera as recited in claim 1, wherein the image sensor is exposed to light in response to a capture command.

12. A digital camera as recited in claim 1, wherein the first and second images are taken in a dim lighting condition.

13. A digital camera as recited in claim 1, wherein the first image is underexposed.

14. A digital camera as recited in claim 1, wherein the second image is blurred.

15. A digital camera as recited in claim 1, wherein the luminance correction comprises:

determining a spatial coherence and color statistics of the first and second images; and

utilizing the determined color statistics and spatial coherence to enhance an underexposed one of the first and second images.

16. A digital camera as recited in claim 1, wherein the image sensor is selected from a group comprising a CCD and a CMOS.

17. A digital camera as recited in claim 1, wherein the digital camera is integrated into a device selected from a group comprising a cell phone, a watch, and a PDA.

18. A digital camera as recited in claim 1, wherein the luminance correction comprises modifying a color mapping function of the first and second images to cover a relatively larger range for a high contrast scene.

19. A digital camera as recited in claim 1, wherein the luminance correction comprises utilizing color histogram equalization to determine color statistics corresponding to the first and second images, wherein the color histogram equalization comprises:

transferring the first and second images to a perception-based color space;

clustering color distributions in the perception-based space;

performing histogram equalization in the perception-based space; and

transferring a result of the histogram equalization to a red-green-blue space.

20. A digital camera as recited in claim 1, wherein the luminance correction comprises utilizing spatial region matching to determine a spatial coherence corresponding to the first and second images, wherein the spatial region matching comprises:

segmenting a blurred one of the first and second images into a plurality of similarly colored regions;

eroding each of the regions;

determining a number of iterations to completely erode each region;

determining a region center for each of the regions;

sorting the iteration numbers in descending order;

selecting pixel pairs from the first and second images in matching positions; and

calculating a neighborhood value for each selected pixel.

21. A digital camera as recited in claim 1, wherein an exposure bracketing feature of a digital camera is utilized to capture the first and second images.

22. A digital camera as recited in claim 1, wherein the scene is selected from a group comprising a high movement scene, a biological matter scene, a dimly lit scene, and a high action scene.

23. A digital camera as recited in claim 1, wherein the digital camera is attached to a device selected from a group comprising a microscope and an electronic microscope.

24. A digital camera as recited in claim 1, further comprising a plurality of image sensors.

25. A digital camera as recited in claim 1, further comprising a plurality of buffers to store data.

26. A digital camera as recited in claim 1, further comprising a shutter that remains open during the capturing of the first and second images.

27. A method comprising:

exposing an image sensor to a scene;

capturing a first image of the scene;

capturing a second image of the scene after capturing the first image; and

applying luminance correction to the captured images,

wherein the image sensor remains exposed to light between the capturing of the first image and the capturing of the second image.

28. A method as recited in claim 27, wherein the first image is underexposed.

29. A method as recited in claim 27, wherein the second image is blurred.

30. A method as recited in claim 27, wherein the luminance correction is applied in accordance with luminance correction instructions stored on a storage device communicationally coupled to the image sensor.

31. A method as recited in claim 27, wherein the luminance correction is applied in accordance with luminance correction instructions stored on a storage device communicationally coupled to the image sensor and data corresponding to the captured images are buffered in one or more storage devices.

32. A method as recited in claim 27, wherein the luminance correction is applied by a processing unit communicationally coupled to the image sensor.

33. A method as recited in claim 27, wherein the luminance correction is applied by an external computing device communicationally coupled to the image sensor.

34. A method as recited in claim 27, wherein the image sensor is implemented in a digital camera.

35. A method as recited in claim 27, wherein the application of luminance correction comprises:

determining a spatial coherence and color statistics of the first and second images; and

utilizing the determined color statistics and spatial coherence to enhance an underexposed one of the first and second images.

36. An apparatus comprising:

means for capturing a first image of a scene;

means for capturing a second image of the scene after capturing the first image; and

means for applying luminance correction to the captured images.

37. An apparatus as recited in claim 36, further comprising means for exposing an image sensor to the scene.

38. An apparatus as recited in claim 36, further comprising means for storing the captured images.

39. An apparatus as recited in claim 36, further comprising means for exposing an image sensor to light while the firs and second images are captured.